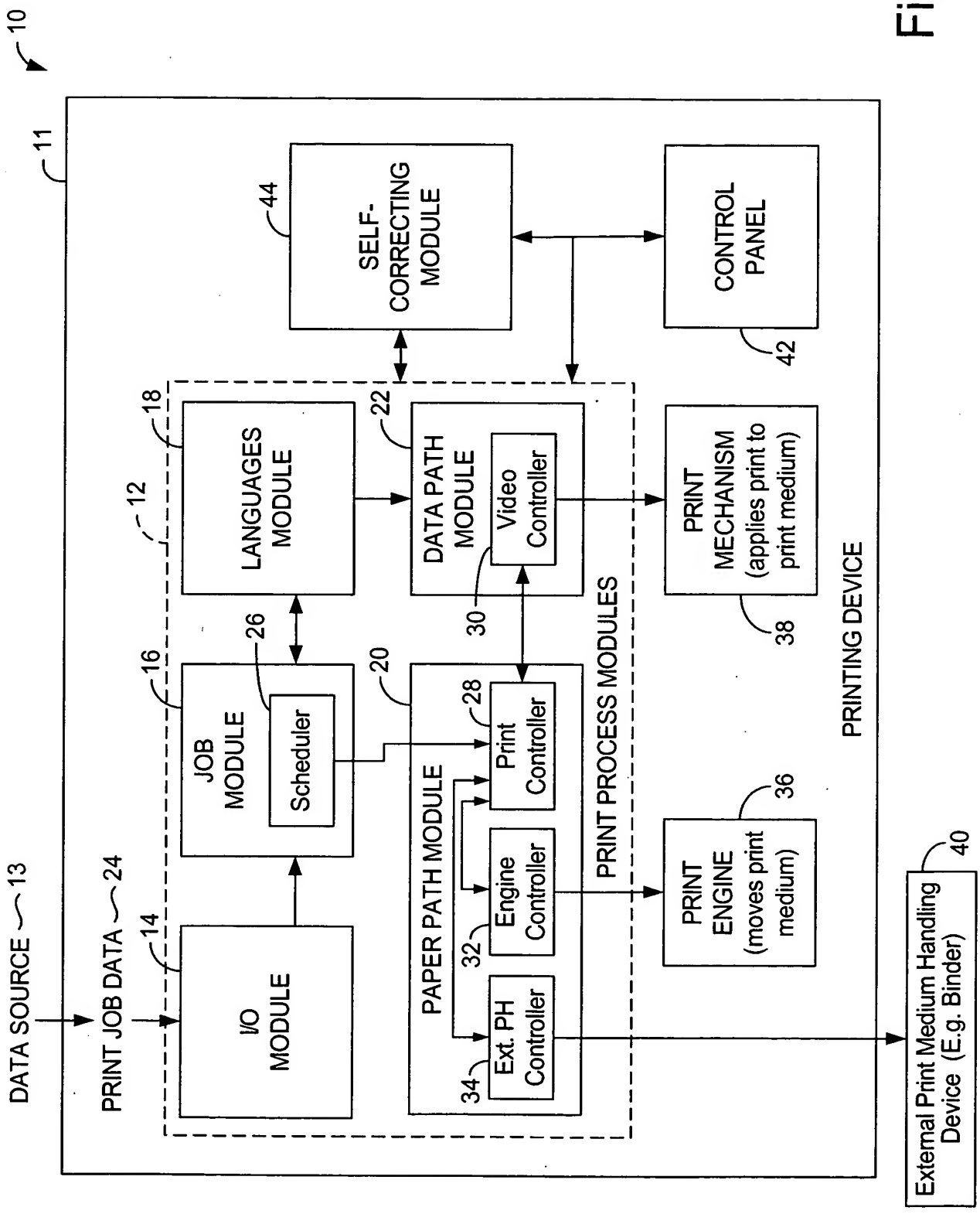
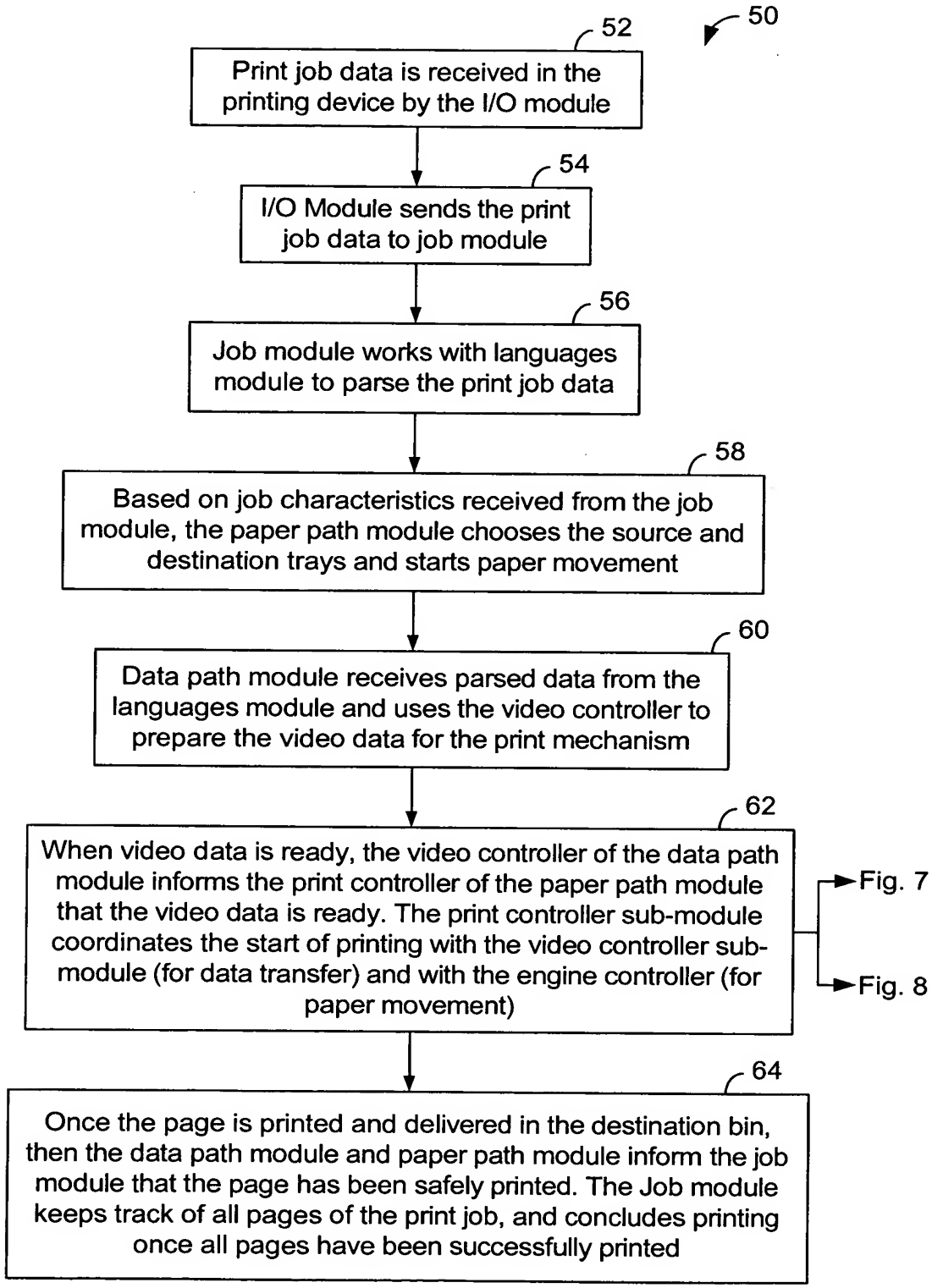

10
11
DATA SOURCE
13
PRINT JOB DATA
24
14
I/O MODULE
16
JOB MODULE
Scheduler
26
12
18
LANGUAGES MODULE
20
PAPER PATH MODULE
Print Controller
28
Engine Controller
32
Ext. PH Controller
34
22
DATA PATH MODULE
Video Controller
30
PRINT PROCESS MODULES
44
SELF-CORRECTING MODULE
PRINT ENGINE (moves print medium)
36
PRINT MECHANISM (applies print to print medium)
38
CONTROL PANEL
42
PRINTING DEVICE
External Print Medium Handling Device (E.g. Binder)
40

Fig. 1



Communication flow for a successful print job

Fig. 2

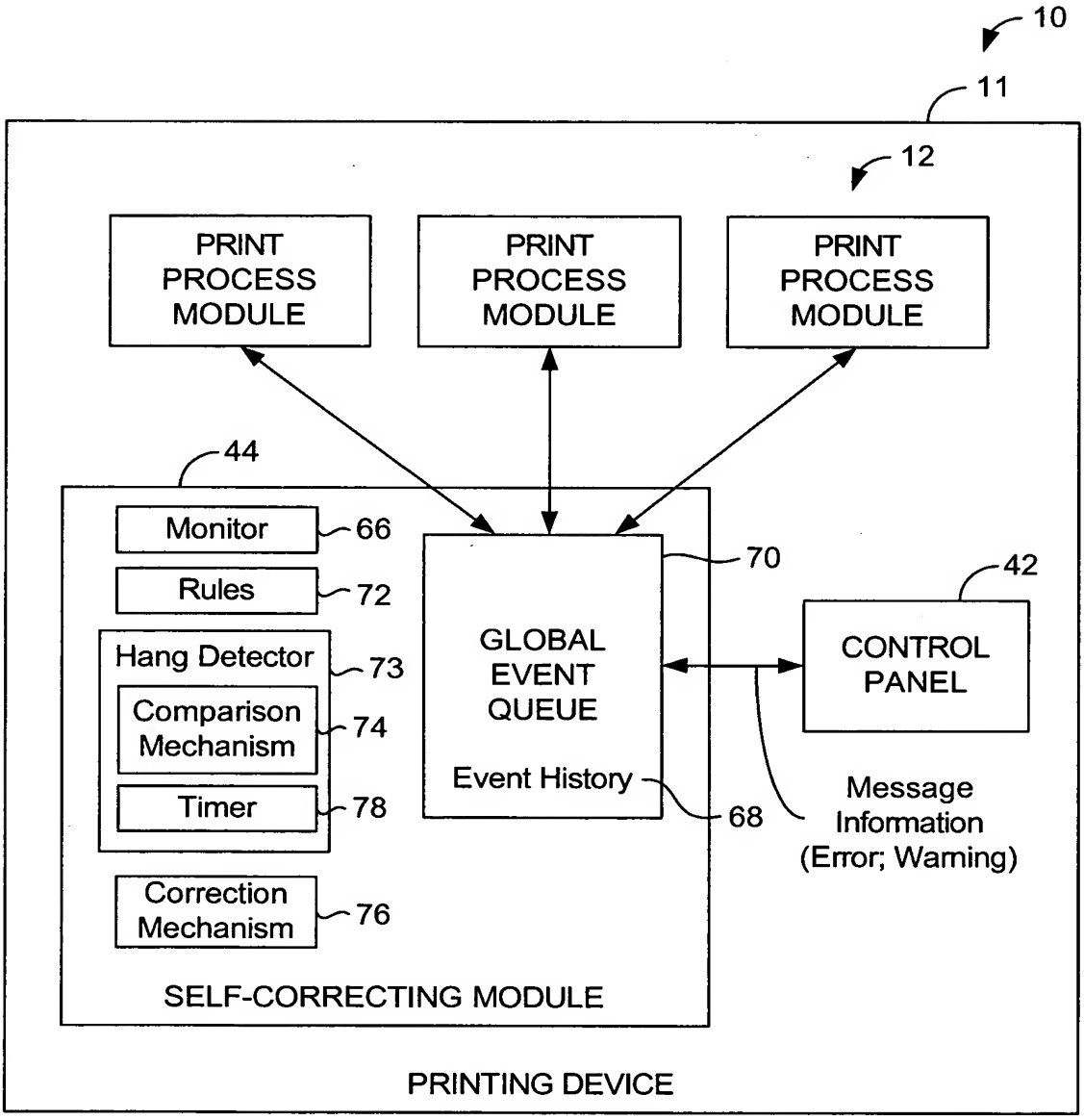

10
11
12
PRINT PROCESS MODULE
PRINT PROCESS MODULE
PRINT PROCESS MODULE
44
Monitor
66
Rules
72
Hang Detector
73
Comparison Mechanism
74
Timer
78
Correction Mechanism
76
SELF-CORRECTING MODULE
GLOBAL EVENT QUEUE
70
Event History
68
CONTROL PANEL
42
Message Information (Error; Warning)
PRINTING DEVICE

Fig. 3

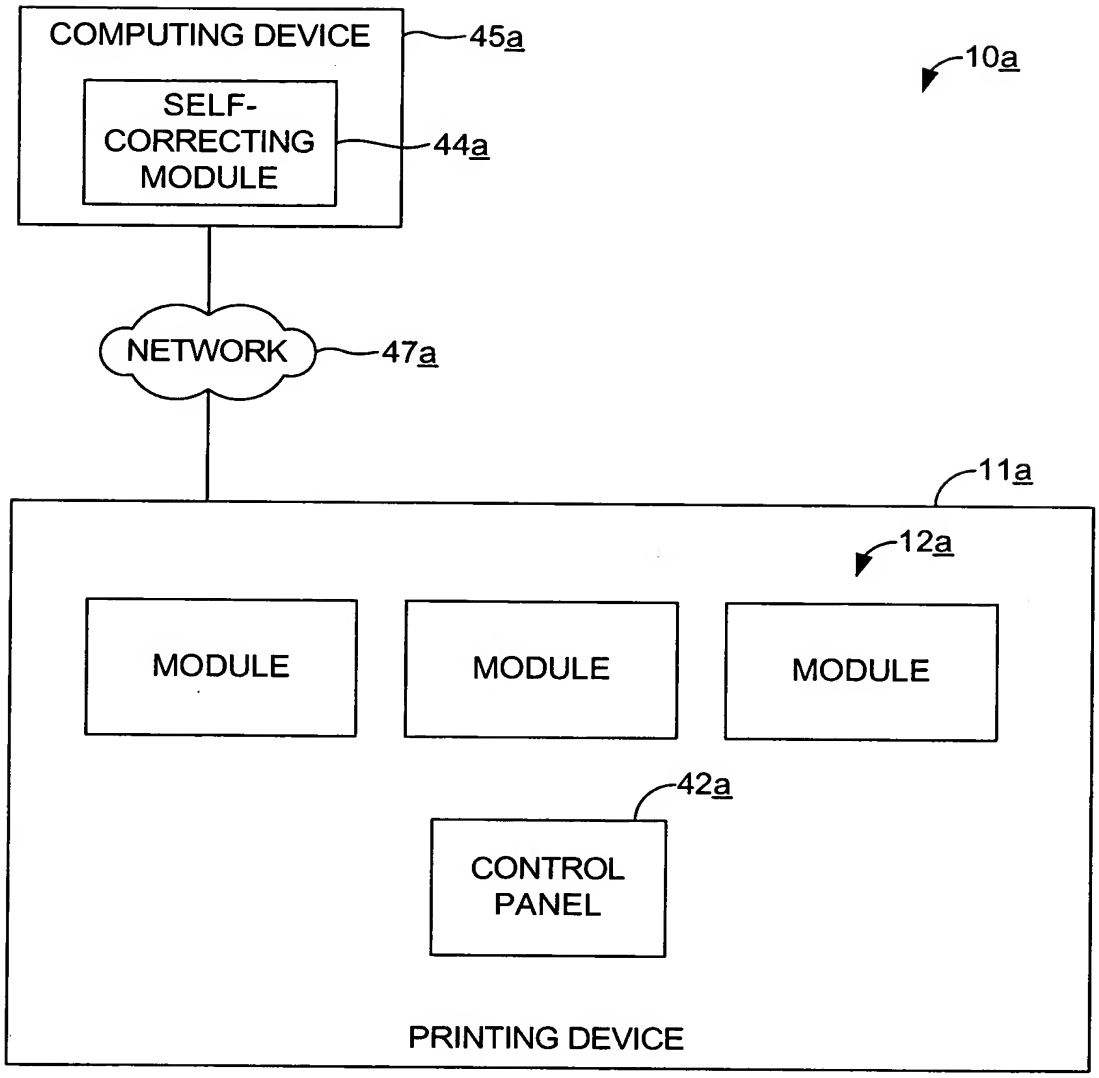

COMPUTING DEVICE
45a
10a
SELF-CORRECTING MODULE
44a
NETWORK
47a
11a
12a
MODULE
MODULE
MODULE
42a
CONTROL PANEL
PRINTING DEVICE

Fig. 4

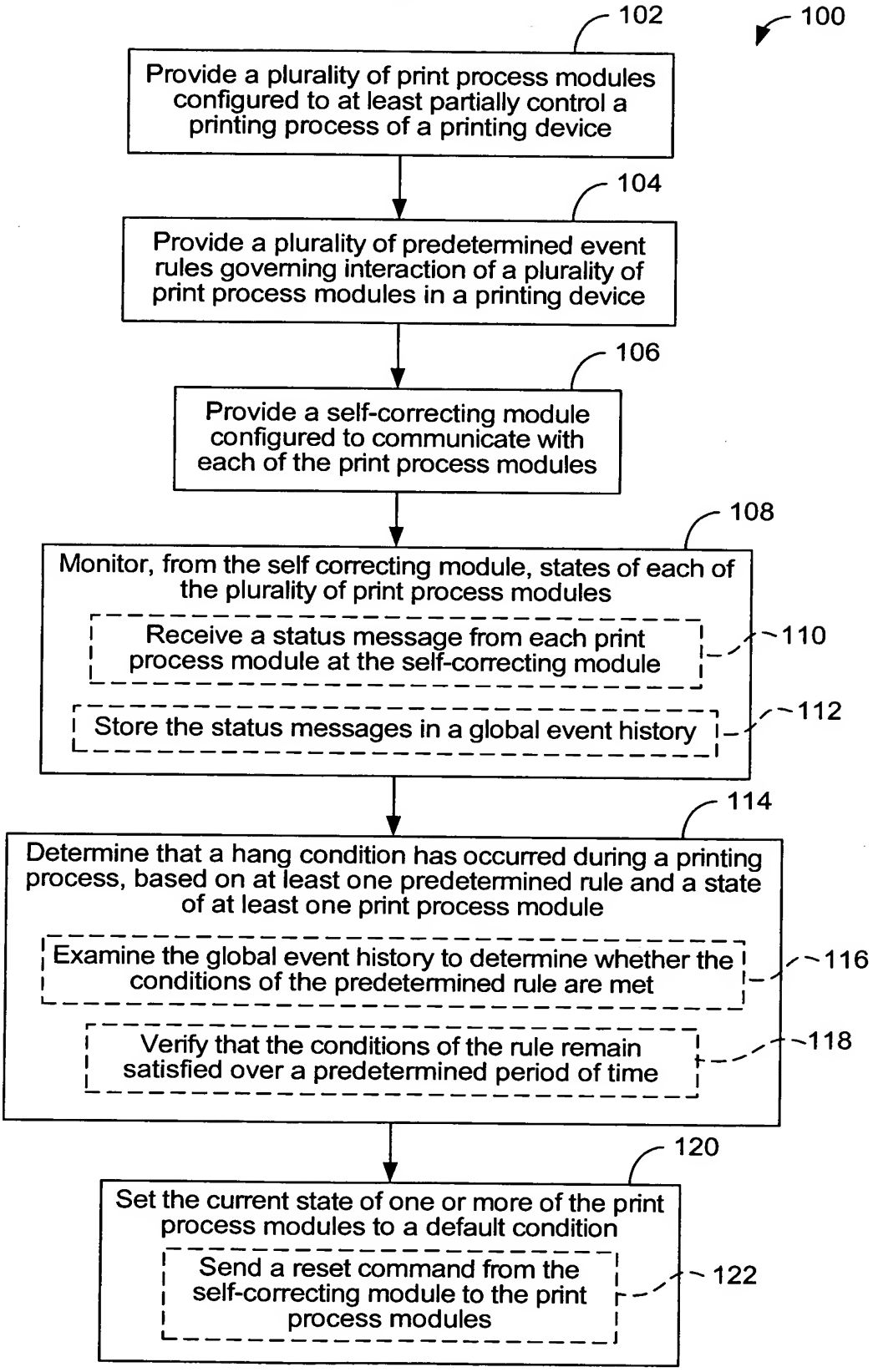

100
102
Provide a plurality of print process modules configured to at least partially control a printing process of a printing device
104
Provide a plurality of predetermined event rules governing interaction of a plurality of print process modules in a printing device
106
Provide a self-correcting module configured to communicate with each of the print process modules
108
Monitor, from the self correcting module, states of each of the plurality of print process modules
Receive a status message from each print process module at the self-correcting module
110
Store the status messages in a global event history
112
114
Determine that a hang condition has occurred during a printing process, based on at least one predetermined rule and a state of at least one print process module
Examine the global event history to determine whether the conditions of the predetermined rule are met
116
Verify that the conditions of the rule remain satisfied over a predetermined period of time
118
120
Set the current state of one or more of the print process modules to a default condition
Send a reset command from the self-correcting module to the print process modules
122

Fig. 5

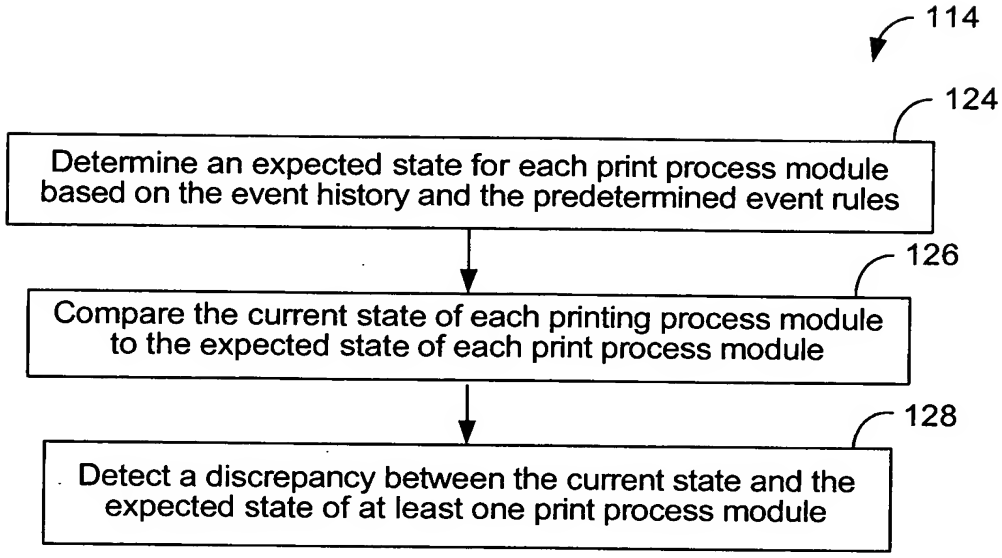
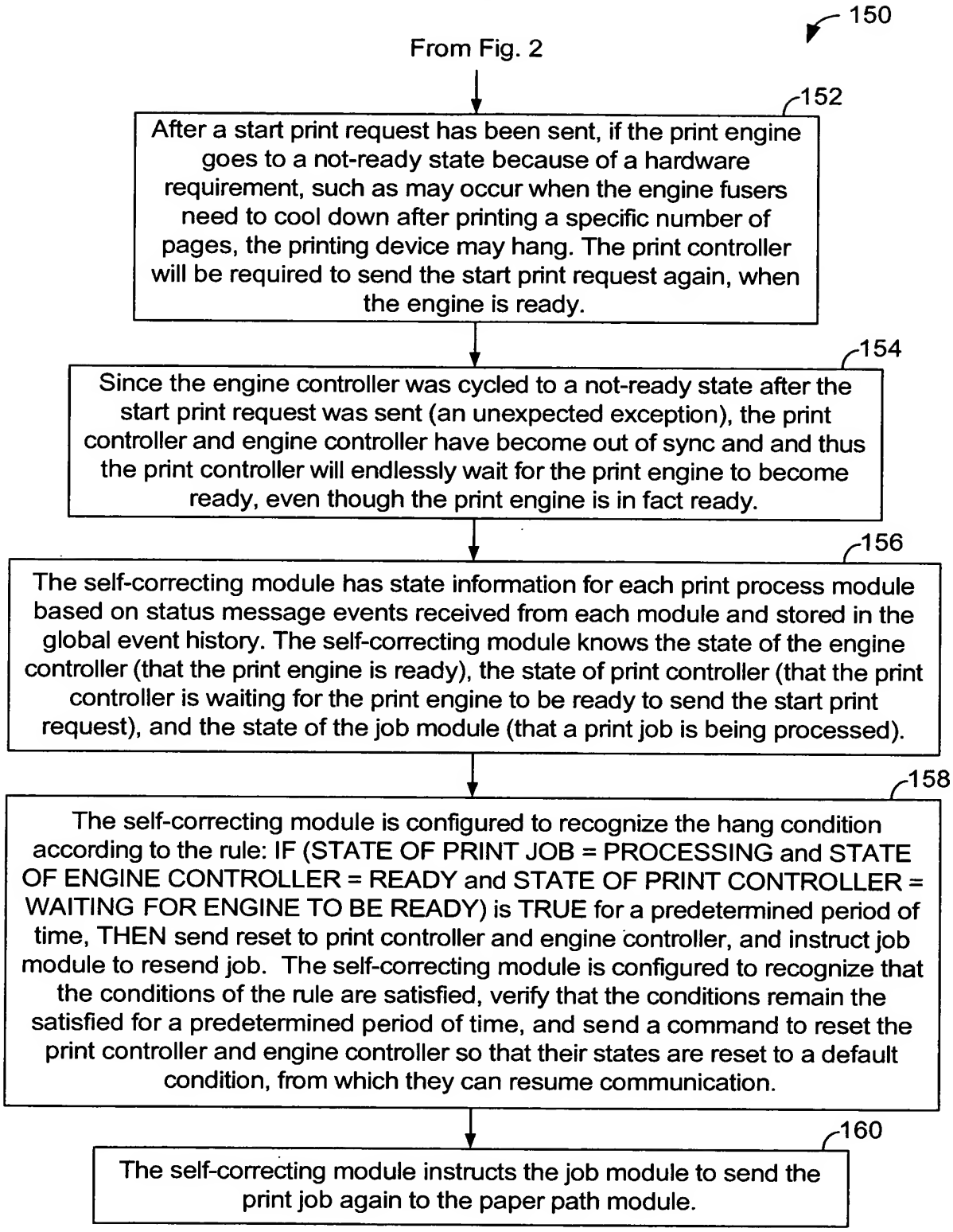
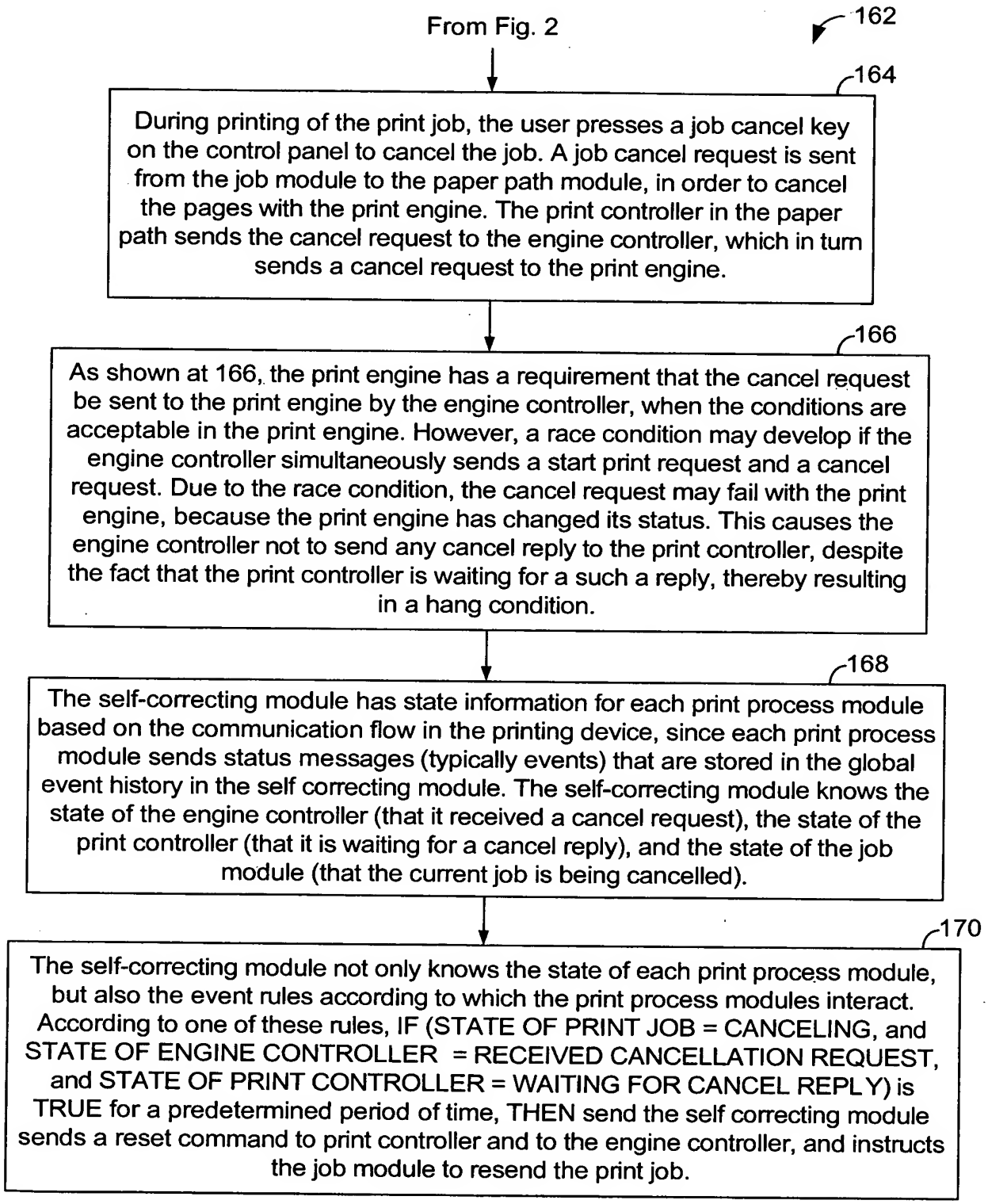

114
124
Determine an expected state for each print process module based on the event history and the predetermined event rules
126
Compare the current state of each printing process module to the expected state of each print process module
128
Detect a discrepancy between the current state and the expected state of at least one print process module

Fig. 6



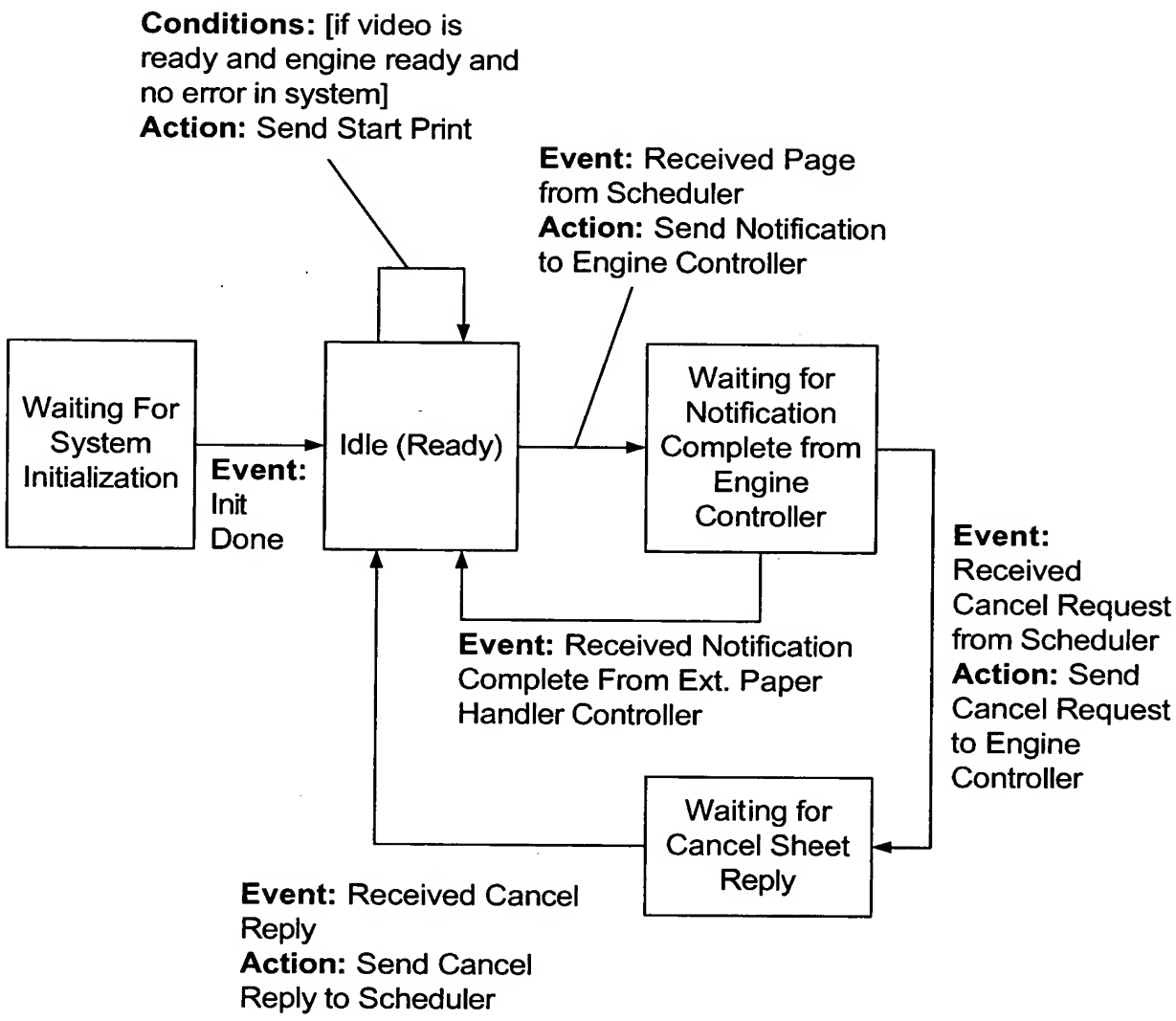
Communication flow for a scenario where the paper path module is hung becaus print engine goes to a not-ready state after a start print has been issued

Fig. 7



Communication flow for a scenario where the printing device is hung because of a race condition in the paper path modul during a job cancel request

Fig. 8



Print Controller States Relating to Page Notification and Cancellation

Fig. 9